REMARKS

After the foregoing Amendment, claims 1-20, as originally filed, are active in the present application. No amendment has been made to any of the claims.

Specification

The title was objected to as not being descriptive. By the foregoing Amendment, the title has been changed to read "OPTICAL DISC DRIVE INCLUDING DETECTION AND CORRECTION OF SPHERICAL ABERRATION". Applicants respectfully submit that the title, as amended, is fully descriptive of the claimed subject matter of the present application. Accordingly, any objection to the title should be withdrawn.

Rejection Under 35 U.S.C. § 112

Claims 1-7 and 12-20 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which the Applicants regard as the invention. In particular, the Examiner objected to the phrase "light quantity" which appears in claims 1, 12, 16, 18, 19 and 20. It was the position of the Examiner that the above-quoted phrase was not definite. Applicants respectfully traverse this rejection for the reasons as set forth below.

Initially, Applicants note that the objected-to phrase does not appear in claim 17 and respectfully request that the rejection with respect to claim 17 should be withdrawn.

The phrase "light quantity" as cited in claim 1 and the other independent claims as noted by the Examiner is specifically referenced in paragraphs **[0103]** and **[0120]** of the original specification and is intended to be given its ordinary meaning, namely, the "quantity or amount of the light." As noted in the above-referenced paragraphs, the quantity of the light is used to generate a further current signal, the signal being proportional to the quantity or amount of the light as received on the light detector. It is respectfully submitted that it is very well known in the art that a photo detector such as photo detector 40 or photo detector 41 as shown in Fig. 1 of the present application detects the received light and outputs an electrical signal which varies in accordance with the quantity of the light. (See, for example, U.S. Patent No. 4,920,527 to

Maeda, at column 6, lines 7-26). It is respectfully submitted that in the present application, no other definition is set forth which would in any way differ from the ordinary and usual meaning of the term "light quantity." Thus, the phrase should be interpreted in the usual sense to mean the quantity or amount of the light. The Examiner has correctly noted that "light quantity" is not the same as the term "light amplitude," as found, for example, in claim 8.

In view of the foregoing discussion, it is respectfully submitted that when the term "light quantity" is given its ordinary meaning as well known in the art, this term is sufficiently definite. It is therefore respectfully submitted that the rejection of claims 1-7 and 12-20 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

Double Patenting Rejections

Claims 1-7, 12-15, 16 and 18 were provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 9 or 13 of co pending Patent Application No. 10/481,206 (the '206 application) in view of the Maeda patent. Similarly, claim 20 was provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claim 1 of the copending '206 patent application in view of the Maeda patent further considered with official notice. For the reasons as set forth in detail below, the Applicants respectfully traverse both of the provisional non-statutory obviousness-type double patenting rejections.

Initially, it is noted that the copending '206 patent application is assigned to the same assignee as the present application and that the four inventors in connection with the present application are also inventors of the subject matter of the '206 application. It is further noted that although the '206 application was actually filed with the U.S. Patent and Trademark Office approximately eight months after the present application was filed, because the '206 application is a national phase of a PCT application, it has received an effective filing date which is approximately 15 months before the filing date of the present application. In support of the traverse of these rejections, the Applicants present the following arguments:

1. Both of the provisional non-statutory obviousness-type double patenting rejections are premature

The ‘206 application has not been examined and at the present time, it is unclear when the ‘206 application will be examined by the U.S. Patent and Trademark Office. Until such time as the ‘206 application has been examined and one or more of the claims have been allowed, it is impossible to know whether or not a U.S. patent will be issued from the ‘206 application. Further, at the present time, it is impossible to know whether any of the claims of the ‘206 application cited by the Examiner in support of the non-statutory obviousness-type double patenting rejections (specifically, claims 1, 9 and 13) will appear in any patent which may be issued from the ‘206 application. Moreover, even if a patent which is issued from the ‘206 application contains such claims, it is not possible to know at this time whether the particular claims would be in the same form in which they currently appear in the ‘206 application or in any form which would support the non-statutory obviousness-type double patenting rejections imposed by the Examiner. It is unreasonable to expect the Applicants to submit a Terminal Disclaimer based upon the present lack of knowledge of the potential for patentability of any of the claims relied upon by the Examiner in imposing the non-statutory obviousness-type double patenting rejections. Accordingly it is respectfully that the rejections be withdrawn or at least held in abeyance as being premature

2. Because the ‘206 application has not yet been examined, the delay could result in actually extending the life of any patent which may issue from the present application.

Any patent which may issue from the present application would normally be expected to expire on October 2, 2023 (plus any additional days which may be added as a result of certain prosecution delays or other factors). At the present time, any patent which issues with respect to the ‘206 application would normally expire on July 4, 2022, approximately 15 months before what would normally be the expiration date of the present application. However, there has already been a substantial Patent Office delay prior to the commencement of prosecution in connection with the ‘206 application. Accordingly, if a patent is eventually issued therefrom, the life of the patent will likely be extended by a substantial number of additional days as a result of prosecution delays. While it is not possible, at this time, to determine or predict an exact expiration date of any patent which may issue with respect to the '206 application, it is very possible, and may even be likely, that the expiration date of a patent issuing from the '206 application could be extended well beyond what would normally be the expiration date of the present application, thereby, assuming the filing of a terminal disclaimer, effectively extending the life of any patent issuing from the present application. Thus, the submission of a Terminal Disclaimer, at this time, could result in extending, rather than shortening the life of any patent which may issue with respect to the present application, a situation which the Applicants submit is clearly not intended by the Examiner in imposing the provisional non-statutory obviousness double patenting rejections. Accordingly it is respectfully requested that the rejections be withdrawn or at least held in abeyance as being premature

3. The Examiner has not correctly interpreted the claims of the '206 application.

The present application describes and claims an optical disc drive having very specific processing circuitry. In particular, as shown in Figs. 2 and 4, an apparatus in accordance with the first embodiment of the present invention includes two photo detectors, namely, an inner photo detector 41 for detecting the interior portion of the reflected light beam (30-2 on Fig. 3) and an outer photo detector 40 for detecting the outer portion of the reflected light beam (30-1 on Fig. 3). Claim 1 calls for a light-receiving section (in the disclosed embodiment, the photo detectors 40 and 41) for receiving a peripheral part of the light reflected by the information storage layer of the disc (the outer part of the reflected light beam 30-1) to generate a first detection signal and for receiving a non-peripheral part of the reflected light (the inner part of the reflected light beam 30-2) to generate a second detection signal. As shown in Fig. 2 and as called for in claim 1, a first focus signal generating section (outer FE generator 44) generates a first focus signal based on the first detection signal (peripheral part of the reflected light) and a second focus signal generating section (inner FE generator 45) separately generates a second focus signal based on the second detection signal (non-peripheral part of the reflected light). Separately, a first light quantity generating section (outer AS generator 70) generates a first light quantity signal based upon the first detection signal (peripheral part of the reflected light) and a second light quantity generating section (inner AS generator 71) separately generates a second light quantity signal based upon the second detection signal (non-peripheral part of the reflected light). A first normalizing section (72) generates a first normalizing signal by normalizing the first focus signal (from the first or outer focus signal generating section 44) based upon the first light quantity signal (from the first light quantity generating section 70). A second normalizing section (73) separately generates a second normalizing signal by normalizing the second focus signal (from the second or inner focus signal generating section 45) based on the second light quantity signal (from the second light quantity generating section 71). Finally, a detection section (31) is provided for generating a spherical aberration signal based upon the first and second normalized signals (from the first and second normalizing sections 72, 73).

Claim 9 of the '206 application, while clearly calling for circuitry and components for the purpose of correcting for spherical aberration, does not specify or even remotely suggest the same or substantially the same structural components as called for in claim 1. In the Office Action, the Examiner equates the "first and second light quantity generating sections" of the present claim 1 as the claimed "light receiving means" of claim 9 of the '206 application. However, it is abundantly clear from a brief review of the '206 patent that the "light receiving means" of claim 9 is clearly intended to be the light receiving part 37 which clearly corresponds to the "light receiving section (4 (including 40 and 41))" as called for in claim 1 of the present application. The Applicants have carefully reviewed claim 9 of the '206 application and can find no structure recited therein which in any way relates to or performs any function which is similar or related to the function of the Applicants' claimed first and second light quantity generating sections (70) and (71). Accordingly, it is respectfully submitted that the Examiner has misinterpreted the scope of claim 9 of the '206 application which does not include any provision for the first and second light quantity generating sections. Moreover, there is no statement, teaching or suggestion in claim 9 of the '206 application which would teach or suggest that the first focus signal (from the first or outer focus signal generating section 44) could be normalized utilizing the first light quantity signal (from the first light quantity generating section 70) and that the second focus signal (from the second or inner focus generating section 45) could be normalized using the second light quantity signal (from the second light quantity generating section 71). Moreover, it is respectfully submitted that there is no teaching or suggestion in the Maeda reference regarding the generation of two separate normalized signals utilizing the first and second focus signals and the first and second light quantity signals as described above.

Independent method claim 16 is parallel to claim 1 and includes substantially the same features recited in a method format.

Independent claim 12 also calls for a "light quantity detection section" for generating a light quantity signal which is used for normalizing an aberration detection signal. Neither claim 9 nor claim 13 of the '206 application provides any recitation or suggestion regarding the inclusion of a light quantity detection section.

Independent claim 18 is parallel to claim 16 but in a method format.

Claim 20 of the present application, like claim 1, calls for first and second focus signal generating sections, first and second light quantity generating sections and first and second normalizing sections as described above with respect to the discussion of claim 1. Again, claim 1 of the '206 application contains no recitation, disclosure or suggestion regarding either the first or the second light quantity generating sections or either the first or second normalizing sections. Moreover, the Maeda reference includes no teaching or suggestion regarding a first normalizing section for generating a first normalizing signal by normalizing a first focus signal based upon a first quantity signal and a second normalizing section for generating a second normalizing signal by normalizing a second focus signal based upon a second quantity signal.

In view of the foregoing discussion, it is respectfully submitted that claims 1-7, 12-15, 16, 18 and 20 are not obvious from any of claims 9, 13 or 1 of the '206 application, either alone or in combination with the Maeda patent.

It is therefore respectfully submitted that the provisional rejection of these claims on the ground of non-statutory obviousness double patenting should be withdrawn.

4. 35 U.S.C. § 103(a) Rejection

(1) Claims 8-11 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,774,444 (Shimano *et al.*) considered with the Maeda patent and with U.S. Patent Publication No. 2002/0048243 (Yanagisawa *et al.*). It is the Examiner's position that the Shimano *et al.* patent discloses the ability of generating a light beam to an optical record medium and reproducing the read information. The Examiner states that the reflected beams are appropriately segregated into an outer and inner peripheral beam but there is no depiction of focusing control. The Examiner further states that the focusing control using such a divided

scheme is taught by the Maeda patent and that the Yanagisawa *et al.* reference also teaches the ability of compensating for tilt, which the Examiner interprets as the spherical aberration limitations. For the reasons as set forth below, the Applicants respectfully traverse the rejection of these claims.

Independent claims 8 and 17, as well as dependent claims 9-11, relate to the second embodiment shown on Fig. 8 and described in the specification beginning at paragraph **[0131].** In addition to other features, claim 8 calls for a first focus signal generating section (44) for generating a first focus signal based upon the detection signal according to a focusing state of the reflected light in the peripheral part, a second focus signal generating section (45) for generating a second focus signal based on the second detection signal according to a focusing state of the light in the non-peripheral part, a first measuring section (74) for measuring the amplitude of the first focus signal to generate a first amplitude signal, a second measuring section (75) for measuring the amplitude of the second focus signal to generate a second amplitude signal, a first normalizing section (80) for generating a first normalized signal by normalizing the first focus signal based upon the first amplitude signal, and a second normalizing section (81) for generating a second normalizing signal by normalizing the second focus signal based on the second amplitude signal, and a detection section (31) for generating spherical aberration signal based upon the first and second normalized signals.

The Shimano *et al.* patent does not disclose or suggest a focusing control/capability as admitted by the Examiner in paragraph 8 of the Office Action. Accordingly, it is clear that the Shimano *et al.* fails to disclose or suggest the generation of a first normalizing signal by normalizing a first focus signal based on a first amplitude signal or the generation of a second normalizing signal by normalizing a second focus signal based on a second amplitude signal, nor does the Shimano *et al.* patent suggest generating a spherical aberration signal based upon the first and second normalized signals.

The Examiner relies upon the Maeda patent as teaching focusing control using a divided scheme. However, Maeda does not disclose, teach or suggest generating separate first and second normalized signals. In the Maeda patent, a single focus error signal is generated based upon multiple signals obtained from a plurality of light-receiving areas of a photo detector. However, there is no disclosure, teaching or suggestion in the Maeda reference regarding the generation of two separate focus error signals with each signal being based upon the detection of a focusing state of light in each of two separate areas of the reflected light signal as called for in claims 8 and 17. Further, there is no disclosure, teaching or suggestion in the Maeda patent regarding the generation of separate first and second amplitude signals or the generation of the separate first and second normalized signals as called for in claims 8 and 17. Accordingly, it is respectfully submitted that the Maeda patent does not compensate for the lack of teachings in the primary Shimano *et al.* patent as cited by the Examiner.

Likewise, the Yanagisawa *et al.* reference does not disclose, teach or suggest the concept of generating two separate focus error signals with each signal being based upon a different area of the reflected light signal as called for in claims 8 and 17. The Yanagisawa *et al.* reference also contains no disclosure, teaching or suggestion regarding the generation of first and second amplitude signals or the generation of first and second normalized signals as called for in Applicants' claims 8 and 17. Accordingly, it is respectfully submitted that the Yanagisawa *et al.* reference does not make up for the deficiencies of the alleged combination of the Shimano *et al.* patent and the Maeda patent.

The Yanagisawa *et al.* reference as observed by the Examiner is concerned with "tilt". It is well known in the art that "tilt" is tilting a normal which is defined perpendicularly to the optical axis usually due to an inclination and/or warp in the optical disc. In paragraph **[0005]**, the Yanagisawa *et al.* reference refers to a "tilt angle" as an angular deviation between the optical axis of a beam emitted from the optical pickup and the normal direction of the optical disc at an illuminated position. On the other hand, in the present application and as is well known in the art, "spherical aberration" occurs as a result of an uneven thickness of the protective layer of an optical disc (see paragraph **[0029]**) and is not related to "tilt".

Based upon the foregoing, it is respectfully submitted that claims 8 and 17, as well as dependent claims 9-11, distinguish patentably over the triple reference combination cited by the Examiner, and the rejection of these claims should be withdrawn.

(2) Claim 19 was rejected under 35 U.S.C. § 103 as being unpatentable over the art as applied with respect to claim 8 and further in view of official notice. In particular, the Examiner has taken official notice that providing a set of instructions on a computer product is well known and is therefore taken official notice thereof. Similarly, claim 20 was rejected under 35 U.S.C.

§ 103 as being unpatentable over the art as applied to claim 8 and further considered with official notice. The Examiner has taken the position that the existence of a microcomputer is considered well known in the art and is taken official notice thereof. For the reasons as set forth below, the Applicants respectfully traverse the rejections of claims 19 and 20.

Claims 19 and 20 both include the requirements of a first focus signal generated based upon received light in the peripheral part, a second focus signal generated based upon light received in the non-peripheral part, a first light quantity signal generated according to light quantity of the peripheral part, a second light quantity signal generated according to light quantity of the non-peripheral part, a first normalizing signal generated based upon the first focus signal and the first light quantity signal, a second normalizing signal generated based upon the second focus signal and the second light quantity signal, and a spherical aberration signal generated based upon the first and second normalized signals. As discussed in detail above with respect to the rejection of claims 8 and 17, the Shimano *et al.* patent, the Maeda patent and the Yanagisawa *et al.* application, whether taken alone or in the combination suggested by the Examiner, do not disclose, teach or suggest the use of two separate portions of the reflected light signal for generating two separate focus signals, and two first light quantity signals with the first focus signal being normalized by the first light quantity signal to generate a first normalized signal and the second focus signal being normalized utilizing the second light quantity signal.

Accordingly, for the reasons as set forth in detail above, it is respectfully submitted that claims 19 and 20 distinguish patentably over the triple reference combination cited by the Examiner and, therefore, the rejections of these claims should be withdrawn.

Conclusion

In view of the foregoing, it is respectfully submitted that the present application, including claims 1-20, is in condition for allowance and such action is respectfully solicited.

Respectfully submitted,

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(Date)

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Enclosures